

CLAIMS

What is claimed is:

1. A print cartridge comprising:
 - a cartridge body having a lower portion and a vertical wall;
 - a printhead attached to said lower portion;
 - said printhead including a first outboard array of drop generators organized in a first set of primitive groups, a second outboard array of drop generators organized in a second set of primitive groups and an inboard columnar array of drop generators organized in a third set of primitive groups and a fourth set of primitive groups;
 - a contact array disposed on said vertical wall including a first outboard pair of columnar arrays of contact areas having contact areas electrically connected to said first set of primitive groups, a second outboard pair of columnar arrays of contact areas having contact areas electrically connected to said second set of primitive groups and said third set of primitive groups, and an inboard pair of columnar arrays of contact areas having contact areas electrically connected to said fourth set of primitive groups;
 - said pairs of columnar arrays of contact areas being side by side.
2. The print cartridge of claim 1 wherein:
 - the columnar arrays of each pair diverge from each other in a direction toward said bottom portion; and
 - each pair spans at least 70% of a height of a region occupied by said contact array.
3. The print cartridge of claim 2 wherein each of said columnar arrays includes a lower contact area, and wherein adjacent lower contact areas of adjacent pairs of contact areas are separated center to center by at least about 2.8 millimeters.

4. The print cartridge of claim 2 wherein each of outermost transversely separated columnar arrays include fewer contact areas than columnar arrays between said outermost transversely separated columnar arrays.

5. The print cartridge of claim 1 wherein each of said pairs of columnar arrays includes at least one ground contact area such that the contact array includes a plurality of ground contact areas.

6. The print cartridge of claim 5 wherein said inboard pair of columnar arrays includes two ground contact areas.

7. The print cartridge of claim 6 wherein each columnar array of said inboard pair of columnar arrays includes a ground contact area.

8. The print cartridge of claim 5 wherein said ground contact areas are electrically interconnected by traces disposed proximately to said columnar arrays.

9. The print cartridge of claim 5 further including respective conductive traces for electrically connecting said ground contact areas to said printhead.

10. The print cartridge of claim 1 wherein said columnar arrays are substantially linear.

11. A print cartridge comprising:
a cartridge body having a lower portion and a vertical wall;
a printhead attached to said lower portion;
said printhead including a first outboard array of drop generators organized in a first set of primitive groups, a second outboard array of

drop generators organized in a second set of primitive groups and an inboard columnar array of drop generators organized in a third set of primitive groups and a fourth set of primitive groups;

a contact array disposed on said vertical wall including a first outboard pair of columnar arrays of contact areas having contact areas electrically connected to said first set of primitive groups, a second outboard pair of columnar arrays of contact areas having contact areas electrically connected to said second set of primitive groups and said third set of primitive groups, and an inboard pair of columnar arrays of contact areas having contact areas electrically connected to said fourth set of primitive groups;

said pairs of columnar arrays of contact areas being side by side;

said columnar arrays including respective lower contact areas disposed along a lower portion of said region; and

wherein lower contact areas located between transversely outermost lower contact areas are further from said lower portion than said transversely outermost lower contact areas.

12. The print cartridge of claim 11 wherein adjacent lower contact areas of adjacent pairs of columnar arrays of contact areas are separated center to center by at least about 2.8 millimeters.

13. The print cartridge of claim 11 wherein each of outermost transversely separated columnar arrays include fewer contact areas than columnar arrays between said outermost transversely separated columnar arrays.

14. The print cartridge of claim 11 wherein each of said pairs of columnar arrays includes at least one ground contact area such that the contact array includes a plurality of ground contact areas.

15. The print cartridge of claim 14 wherein said inboard pair of columnar arrays includes two ground contact areas.

16. The print cartridge of claim 14 wherein each columnar array of said inboard pair of columnar arrays includes a ground contact area.

17. The print cartridge of claim 14 wherein said ground contact areas are electrically interconnected by traces disposed proximately to said columnar arrays.

18. The print cartridge of claim 14 further including respective conductive traces for electrically connecting said ground contact areas to said printhead.

19. The print cartridge of claim 11 wherein said columnar arrays are substantially linear.

20. A print cartridge comprising:

- a cartridge body having a lower portion and a vertical wall;

- a printhead attached to said lower portion;

- said printhead including a first outboard array of drop generators organized in a first set of primitive groups, a second outboard array of drop generators organized in a second set of primitive groups and an inboard columnar array of drop generators organized in a third set of primitive groups and a fourth set of primitive groups;

- a contact array disposed on said vertical wall including a first outboard pair of columnar arrays of contact areas having contact areas electrically connected to said first set of primitive groups, a second outboard pair of columnar arrays of contact areas having contact areas electrically connected to said second set of primitive groups and said third set of primitive groups, and an inboard pair of columnar arrays of

contact areas having contact areas electrically connected to said fourth set of primitive groups;

said pairs of columnar arrays of contact areas being side by side and occupying a region having a height in the range of about 10 to 14 millimeters and a width in the range of about 15 to 18 millimeters.

21. The print cartridge of claim 20 wherein each of said columnar arrays includes a lower contact area, and wherein adjacent lower contact areas of adjacent pairs of contact areas are separated center to center by at least about 2.8 millimeters.

22. The print cartridge of claim 20 wherein each of outermost transversely separated columnar arrays include fewer contact areas than columnar arrays between said outermost transversely separated columnar arrays.

23. The print cartridge of claim 20 wherein each of said pairs of columnar arrays includes at least one ground contact area such that the contact array includes a plurality of ground contact areas.

24. The print cartridge of claim 23 wherein said inboard pair of columnar arrays includes two ground contact areas.

25. The print cartridge of claim 23 wherein each columnar array of said inboard pair of columnar arrays includes a ground contact area.

26. The print cartridge of claim 23 wherein said ground contact areas are electrically interconnected by traces disposed proximately to said columnar arrays.

27. The print cartridge of claim 23 further including respective conductive traces for electrically connecting said ground contact areas to said printhead.

28. The print cartridge of claim 20 wherein said columnar arrays are substantially linear.

29. A print cartridge comprising:
a cartridge body having a lower portion and a vertical wall;
a printhead attached to said lower portion;
said printhead including a first outboard array of drop generators organized in a first set of primitive groups, a second outboard array of drop generators organized in a second set of primitive groups and an inboard columnar array of drop generators organized in a third set of primitive groups and a fourth set of primitive groups;
a contact array disposed on said vertical wall including a first outboard pair of columnar arrays of contact areas having contact areas electrically connected to said first set of primitive groups, a second outboard pair of columnar arrays of contact areas having contact areas electrically connected to said second set of primitive groups and said third set of primitive groups, and an inboard pair of columnar arrays of contact areas having contact areas electrically connected to said fourth set of primitive groups;
said pairs of columnar arrays of contact areas being side by side and occupying a region having a height in the range of about 10 to 14 millimeters and a width in the range of about 15 to 18 millimeters;
said columnar arrays including respective lower contact areas disposed along a lower portion of said region; and
wherein lower contact areas located between transversely outermost lower contact areas are further from said lower portion than said transversely outermost lower contact areas.

30. A fluid drop ejecting cartridge comprising:

a cartridge body having a lower portion and a vertical wall;

a fluid drop ejecting device attached to said lower portion;

said fluid drop ejecting device including a first outboard array of drop generators organized in a first set of primitive groups, a second outboard array of drop generators organized in a second set of primitive groups and an inboard columnar array of drop generators organized in a third set of primitive groups and a fourth set of primitive groups;

a contact array disposed on said vertical wall including a first outboard pair of columnar arrays of contact areas having contact areas electrically connected to said first set of primitive groups, a second outboard pair of columnar arrays of contact areas having contact areas electrically connected to said second set of primitive groups and said third set of primitive groups, and an inboard pair of columnar arrays of contact areas having contact areas electrically connected to said fourth set of primitive groups;

said pairs of columnar arrays of contact areas being side by side.

31. The fluid drop ejecting cartridge of claim 30 wherein:

the columnar arrays of each pair diverge from each other in a direction toward said bottom portion; and

each pair spans at least 70% of a height of a region occupied by said contact array.

32. The fluid drop ejecting cartridge of claim 31 wherein each of said columnar arrays includes a lower contact area, and wherein adjacent lower contact areas of adjacent pairs of contact areas are separated center to center by at least about 2.8 millimeters.

33. The fluid drop ejecting cartridge of claim 31 wherein each of outermost transversely separated columnar arrays include fewer contact areas

than columnar arrays between said outermost transversely separated columnar arrays.

34. The fluid drop ejecting cartridge of claim 30 wherein each of said pairs of columnar arrays includes at least one ground contact area such that the contact array includes a plurality of ground contact areas.

35. The fluid drop ejecting cartridge of claim 34 wherein said inboard pair of columnar arrays includes two ground contact areas.

36. The fluid drop ejecting cartridge of claim 35 wherein each columnar array of said inboard pair of columnar arrays includes a ground contact area.

37. The fluid drop ejecting cartridge of claim 34 wherein said ground contact areas are electrically interconnected by traces disposed proximately to said columnar arrays.

38. The fluid drop ejecting cartridge of claim 34 further including respective conductive traces for electrically connecting said ground contact areas to said printhead.

39. The fluid drop ejecting cartridge of claim 30 wherein said columnar arrays are substantially linear.

40. The fluid drop ejecting cartridge of claim 30 wherein said fluid drop ejecting device comprises a thermal jetting device.

41. An interconnect circuit comprising:
a flexible substrate;
a contact array configured to be electrically connected to a fluid drop ejecting device that includes a first outboard array of drop generators organized in a first set of primitive groups, a second outboard

array of drop generators organized in a second set of primitive groups and an inboard columnar array of drop generators organized in a third set of primitive groups and a fourth set of primitive groups;

said contact array including a first outboard pair of columnar arrays of contact areas having contact areas configured to be electrically connected to the first set of primitive groups, a second outboard pair of columnar arrays of contact areas having contact areas configured to be electrically connected to the second set of primitive groups and the third set of primitive groups, and an inboard pair of columnar arrays of contact areas having contact areas configured to be electrically connected to the fourth set of primitive groups;

said pairs of columnar arrays of contact areas being side by side.

42. The interconnect circuit of claim 41 wherein:

the columnar arrays of each pair diverge from each other in a direction toward said bottom portion; and

each pair spans at least 70% of a height of a region occupied by said contact array.

43. The interconnect circuit of claim 42 wherein each of said columnar arrays includes a lower contact area, and wherein adjacent lower contact areas of adjacent pairs of contact areas are separated center to center by at least about 2.8 millimeters.

44. The interconnect circuit of claim 42 wherein each of outermost transversely separated columnar arrays include fewer contact areas than columnar arrays between said outermost transversely separated columnar arrays.

45. The interconnect circuit of claim 41 wherein each of said pairs of columnar arrays includes at least one ground contact area such that the contact array includes a plurality of ground contact areas.

46. The interconnect circuit of claim 45 wherein said inboard pair of columnar arrays includes two ground contact areas.

47. The interconnect circuit of claim 46 wherein each columnar array of said inboard pair of columnar arrays includes a ground contact area.

48. The interconnect circuit of claim 45 wherein said ground contact areas are electrically interconnected by traces disposed proximately to said columnar arrays.

49. The interconnect circuit of claim 45 further including respective conductive traces for electrically connecting said ground contact areas to said printhead.

50. The interconnect circuit of claim 41 wherein said columnar arrays are substantially linear.

51. A printing apparatus comprising:
a cartridge body having a lower portion and a vertical wall;
a printhead attached to said lower portion;
said printhead including a first outboard array of drop generators organized in a first set of primitive groups, a second outboard array of drop generators organized in a second set of primitive groups and an inboard columnar array of drop generators organized in a third set of primitive groups and a fourth set of primitive groups;
a contact array disposed on said vertical wall including a first outboard pair of columnar arrays of contact areas having contact areas electrically connected to said first set of primitive groups, a second outboard pair of columnar arrays of contact areas having contact areas electrically connected to said second set of primitive groups and said third set of primitive groups, and an inboard pair of columnar arrays of

contact areas having contact areas electrically connected to said fourth set of primitive groups;

said pairs of columnar arrays of contact areas being side by side;
a print carriage for supporting said print cartridge body; and
an electrical circuit for contactively engaging said contact array.

52. The printing apparatus of claim 51 wherein:

the columnar arrays of each pair diverge from each other in a direction toward said bottom portion; and

each pair spans at least 70% of a height of a region occupied by said contact array.

53. The printing apparatus of claim 52 wherein each of said columnar arrays includes a lower contact area, and wherein adjacent lower contact areas of adjacent pairs of contact areas are separated center to center by at least about 2.8 millimeters.

54. The printing apparatus of claim 52 wherein each of outermost transversely separated columnar arrays include fewer contact areas than columnar arrays between said outermost transversely separated columnar arrays.

55. The printing apparatus of claim 51 wherein each of said pairs of columnar arrays includes at least one ground contact area such that the contact array includes a plurality of ground contact areas.

56. The printing apparatus of claim 55 wherein said inboard pair of columnar arrays includes two ground contact areas.

57. The printing apparatus of claim 56 wherein each columnar array of said inboard pair of columnar arrays includes a ground contact area.

58. The printing apparatus of claim 55 wherein said ground contact areas are electrically interconnected by traces disposed proximately to said columnar arrays.

59. The print cartridge of claim 55 further including respective conductive traces for electrically connecting said ground contact areas to said printhead.

60. The print cartridge of claim 51 wherein said columnar arrays are substantially linear.

61. A method of making a fluid ejection apparatus, comprising:
forming a contact array circuit configured to be electrically connected to a fluid drop ejecting device that includes a first outboard array of drop generators organized in a first set of primitive groups, a second outboard array of drop generators organized in a second set of primitive groups and an inboard columnar array of drop generators organized in a third set of primitive groups and a fourth set of primitive groups;

said contact array circuit including a first outboard pair of columnar arrays of contact areas having contact areas configured to be electrically connected to the first set of primitive groups, a second outboard pair of columnar arrays of contact areas having contact areas configured to be electrically connected to the second set of primitive groups and the third set of primitive groups, and an inboard pair of columnar arrays of contact areas having contact areas configured to be electrically connected to the fourth set of primitive groups;

said pairs of columnar arrays of contact areas being side by side;
electrically connecting the contact array circuit to the fluid drop ejecting device.

62. The method of claim 61 wherein the fluid drop ejecting device is a thermal jetting device.

63. The method of claim 61 wherein the fluid drop ejecting device is an ink jet printhead.